

Appendix

Technical Notes

1. DATA CAUTIONS

- Limitations of small numbers: In cases where there are small numbers of teen births, especially at the city/town level and by race/ethnicity or age, small changes in the numbers from year to year will produce large changes in percentages, making the differences appear more important than they are in reality. Whether or not the small numbers are suppressed, rates and trends based upon small numbers should be interpreted cautiously.
- Differences with previously published data: Numbers and rates in this publication may differ from those contained in previous reports due to updates of birth and death certificate files, differences in the formulas used in calculating rates, and/or the use of updated population estimates for 1991-1997 produced by the Massachusetts Institute for Social and Economic Research (MISER) in November, 1999. (See Foreword for details)
- Missing data: Unless otherwise stated, percentages are based on the number of births or mothers that have *known* information regarding a demographic or birth characteristic.
- Self-reported data: Many items used in this publication, such as maternal smoking, race/ethnicity, and type of health insurance coverage, are self-reported. Self-reported data are subject to the usual limitations of this type of information.
- Calculation of birth rates: Birth rates (number of births per 1,000 women) are calculated using Census counts of the resident population of Massachusetts 1990 and population estimates for 1991-1998. Because the Census is taken only once every ten years, the annual numbers of residents in each city/town and in the state for non-Census years are estimates, not actual counts. Therefore, the numbers of resident women may be underestimated (resulting in inflated birth rates), or overestimated (resulting in lower birth rates). The teen birth rates for 1991-1997 data presented in this report were calculated using updated population estimates for 1991-1997 (see “New Population Data” in Foreword for further information).
- Calculation of infant mortality rates (IMR) for teenage mothers: Death certificates record only the age of the decedent, not that of the mother. To know which infants who died before their first birthday had a teenage or adult mother, it is necessary to link the infant death certificates to their birth certificates since the mother’s age is recorded on the birth certificate. Each year, the Registry of Vital Records and Statistics creates such a file, called the Linked Birth/Infant Death file. All births in a calendar year are linked to all infant deaths occurring within one year of the date of birth, which may be in the same calendar year as the year of birth or in the following year. For example, if an infant is born on June 30, 1997 and dies on March 1, 1998, that infant would be included in the 1997 linked file because he/she was born in 1997 and died before reaching one year of age. The 1998 infant mortality rate for women under the age of 20 will not be available until the 1998 linked birth/infant death file is complete. Therefore, the 1997 maternal age-specific infant mortality rate is the most recent available and is included in this report.

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Since infant mortality rates in this report are calculated using data from the linked birth/infant death file, they are not comparable to the rates published in *Advance Data: Births*, which uses the standard method to calculate IMRs (number of infant deaths in a year per 1,000 live births delivered in the same year).

- Change in the calculation of expected educational attainment: Prior to 1997, the expected level of educational attainment (see *Glossary* for further explanation) was calculated differently for US-born and foreign-born teenage mothers. In this report, the same age-for-grade cutoffs were used regardless of maternal place of birth.
- Change in gestational age categories: Beginning with the 1997 report, full-term infants were defined as having been born between 37 and 42 completed weeks of gestation. Prior to 1997, full-term infants were defined as having gestational ages between 37 and 41 completed weeks of gestation. Therefore, caution should be used when comparing this year's gestational data with data prior to 1997.
- Change in categorization of prenatal care source of payment: Beginning with the 1997 report, free care was included in public source of payment for prenatal care. Prior to 1997, free care was included in other sources of payment. Beginning with this report, the HMO category will represent a third group of prenatal care source of payment. Therefore, caution should be used in comparing 1998 data for private source of payment with previous years' data.
- Community Health Network Areas (CHNAs): The data published in this report reflect the new definitions of CHNAs instituted in January 1997. (See *Glossary* for further definition.)

2. CHANGES IN THE POPULATION ESTIMATES THAT AFFECT BIRTH RATES

This year updated population data for denominators were used for years 1991-1997, and thus, all population based birth rates for 1991-1998 have been affected.

The best source of population data is the US Census, which is conducted every ten years. The US Census is a count of the number of people living in the US. The 1990 Census is the most recent year for which Census data are available. However, since the population changes, 1990 Census data do not accurately reflect the 1998 population. Therefore, it is necessary to estimate the population for intercensal years.

Beginning with *Advance Data: Deaths 1998*, *Advance Data: Births 1998*, and *Adolescent Births 1998*, the Massachusetts Institute for Social and Economic Research (MISER) is the source for all population estimates for 1991 forward. MISER is the US Census designated state data center for the Commonwealth. The methodology used by MISER to estimate the population is superior to the methodology previously used to estimate the population. In previous publications, linear extrapolations from the 1990 and 1995 data were used to estimate the 1996 and 1997 populations. This approach is less accurate than the more recent data source. In the Commonwealth of Massachusetts the influx of immigrants during the 1990s as well as internal

Technical Notes (cont.)

migration, the large college populations that come and go, and specific local events such as the closing of Fort Devens make estimating the population difficult. The linear extrapolation method was not capable of capturing these changes.

The new MISER methodology more closely reflects the dynamics of population change. The 1990 US Census is used as the base population, but MISER captures annual population change through a variety of data sources such as: MDPH birth data, MDPH death data, Immigration and Naturalization Service (INS) data, School Attending Children data, College enrollment data, and tax revenue data.

For the state as a whole, the new population estimates are higher for females ages 15-19 years old (19% higher for 1997) and 15-44 years old (2% higher in 1997) compared to the previously used estimates. When the denominator increases and the numerator stays the same, the overall rate decreases (see Figures 1 and 2 on the following page). However, population changes tend to "wash out" at the state level, since some towns experience growth and others experience decline. The effects of population change are greater at the town level.

The figures on the next page show the effect on the birth rates when the new estimates (solid line) are used as denominators, compared to the old population estimates (dotted line). We apologize for any inconvenience these changes might cause. Ultimately, we feel these modifications will greatly enhance the quality, completeness, depth, and utility of the birth certificate data and this publication.

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Massachusetts Female Population 15-19 MISER Estimates (Comparison of New and Old Birth Rates According to MISER November 1999 Data)

Year	State Total	Teen Births 15-19	New Rate	Old Rate	% Difference
1990*	206,743	7,258	35.1	35.1	0.0
1991	194,537	6,892	35.4	34.2	1.2
1992	190,160	6,555	34.5	33.3	1.2
1993	190,275	6,469	34.0	33.7	0.3
1994	193,420	6,412	33.2	34.3	-1.1
1995	197,873	5,990	30.3	33.0	-2.7
1996	202,229	5,758	28.5	32.6	-4.1
1997	203,601	5,801	28.5	33.8	-5.3
1998	203,601	5,823	28.6	33.9	-5.3

* 1990 data is from U.S. Census

Figure 1. Massachusetts Teen Birth Rate

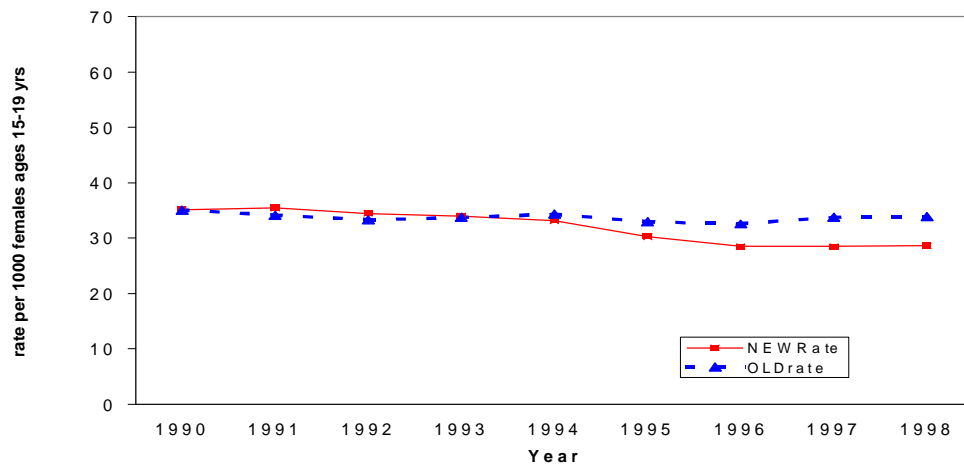
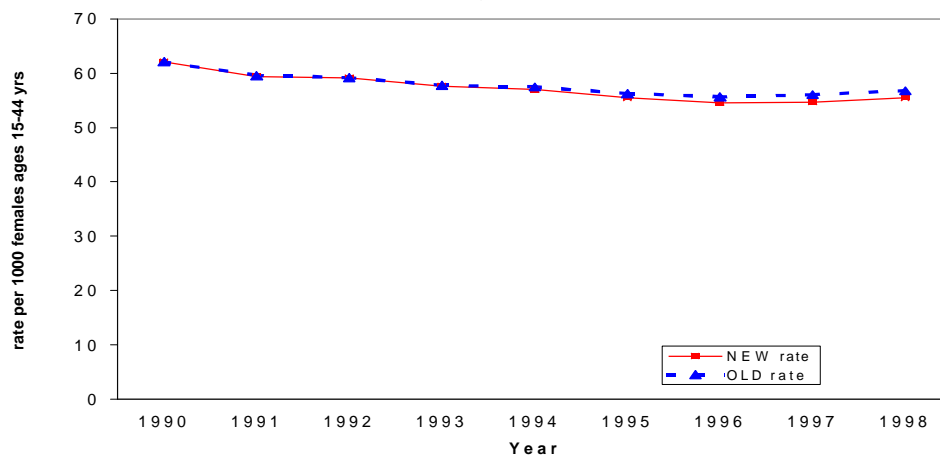


Figure 2. Massachusetts Birth Rate, Women Ages 15-44



Technical Notes (cont.)

3. CHANGES IN THE COLLECTION OF RACE AND ETHNICITY INFORMATION

Assignment of an Infant's Race/Ethnicity: Prior to 1989, the race/ethnicity of an infant was assigned by combining information on the race/ethnicity of the mother and the race/ethnicity of the father. Since 1989, Massachusetts has followed the recommendation of the National Center for Health Statistics of classifying births according to the self-reported race/ethnicity of the mother. Therefore, beginning in 1989, the race/ethnicity of an infant is identical to the self-reported race/ethnicity of the infant's mother.

Addition of Information on Hispanic Ethnicity: Beginning in 1986, an identifier for Hispanic ethnicity was added to the birth certificate; in 1989, an identifier for Hispanic ethnicity was added to the death certificate. Prior to these changes, most Hispanics were included with whites and it was not possible to accurately calculate Hispanic-specific rates of natality and mortality.

Glossary

Adequacy of Prenatal Care: The Index of Adequacy of Prenatal Care (based on the Kessner Index) has five categories (adequate, intermediate, inadequate, no prenatal care, and unknown), based on the trimester in which prenatal care began and the number of prenatal visits. The general classification scheme for full-term infants is as follows:

Category	Trimester Care Began	Number of Visits
Adequate	1	9 or more
Intermediate	1	5-8
	2	5 or more
Inadequate	1	1-4
	2	1-4
	3	1 or more
No prenatal care	--	0
Unknown	unknown	unknown

The classification is adjusted for gestational age to allow for proper classification of premature infants. (*See Foreword.*)

Birth Rate: See Teen Birth Rate.

Birthweight: The weight of an infant recorded at the time of delivery. It may be recorded in either pounds/ounces or grams. If recorded in pounds/ounces, it is converted to grams for use in this report.

1 pound = 453.6 grams

1,000 grams = 2 pounds and 3 ounces

Birthweight Categories:

Normal Birthweight (NBW): An infant's weight of 2,500 grams (5.5 pounds) or more

Low Birthweight (LBW): An infant's weight of less than 2,500 grams (5.5 pounds)

Very Low Birthweight (VLBW): An infant's weight of less than 1,500 grams (3.3 pounds)

Community Health Network Area (CHNA): The Department of Public Health, in collaboration with health service providers, coalition members, and interested citizens, has designated 27 areas for community health planning. Coalitions in each CHNA address the health needs of the community through development of strategies, monitoring of outcomes and the progress of the strategies and responses to those health needs. A CHNA is defined as an aggregation of cities and towns (the City of Boston constitutes its own CHNA). The table at the end of the Appendix provides a list of the 351 cities and towns with the corresponding CHNA number.

Glossary (cont.)

Education: Education is self-reported on the birth certificate by the mother and indicates the highest grade or total number of years of schooling she has completed.

Ethnicity: Mother's ethnicity is self-reported on the birth certificate.

Expected Educational Attainment: The maximum expected age of a student in a particular school grade. Teen mothers were classified as being at least one grade behind if they were two or more years older than the maximum expected age for the reported grade level. For example, if a teen is 16 years old and reports she has completed eighth grade, then she is at least one year behind the expected age for that grade. The following age-for-grade cutoffs were used:

<u>Grade</u>	<u>Maximum Expected Age</u>
6th	12
7th	13
8th	14
9th	15
10th	16
11th	17
12th	18

Gestational Age: The duration of pregnancy measured by number of completed weeks gestation. In this publication, the clinical estimate of gestational age has been used for analysis. Clinical gestational age is determined by the attendant at birth or a physician providing postnatal care to the newborn and is reported on the birth certificate. A normal gestational age is defined as delivery between the completion of the 37th and the 42nd week of pregnancy.

Healthy Start: Healthy Start is a Massachusetts-funded program providing services and financing for prenatal care to low-income (up to 200% of the poverty level in 1997) pregnant women who lack health insurance but do not qualify for Mass Health (Medicaid).

Infant Mortality: See Mortality Categories.

Infant Mortality Rate (IMR): See Mortality Rate Categories

Live Birth: A live birth is defined as any infant who breathes or shows any other evidence of life after delivery (such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles), regardless of duration of gestation or birthweight. All figures and tables in this report, showing Massachusetts data, are based on live births to Massachusetts residents (see Resident Birth).

Glossary (cont.)

Low Birthweight (LBW): See Birthweight Categories.

Mortality Categories:

Infant Mortality: The death of a child under 1 year of age (≤ 364 days old).

Neonatal Mortality: The death of an infant less than 28 days old.

Post Neonatal Mortality: The death of an infant between 28 and 364 days after birth.

Mortality Rate Categories:

Infant Mortality Rate (IMR): The death rate among infants less than one year old per 1,000 live births.

Neonatal Mortality Rate (NMR): The death rate among newborns less than 28 days old per 1,000 live births.

Post Neonatal Mortality Rate (PNMR): The death rate among infants 28-364 days old per 1,000 live births.

Mother's Age: Mother's age is computed from her date of birth and the date of delivery.

Multiparous: A multiparous mother is one who has had at least one prior live birth.

Neonatal Mortality: See Mortality Categories.

Neonatal Mortality Rate (NMR): See Mortality Rate Categories.

Normal Birthweight (NBW): See Birthweight Categories.

Parity: The number of live infants ever born to the mother. Parity includes all previous live births as well as the infant named on the birth certificate.

Paternity Acknowledgement: The process by which the paternity of an infant is legally established when the parents are unmarried. As part of the birth registration process, unmarried parents sign an acknowledgement form and their signatures are notarized. The father's information is then added to the child's birth certificate. Paternity can also be acknowledged at a town clerk's office after the mother and child have been discharged from the hospital. Paternity may be established through legal action or through voluntary acknowledgement in the case of unmarried couples; when a couple is married, the husband is legally considered the infant's father. *Paternity acknowledgement data in this report reflect acknowledgments made in hospitals at the time of birth only.*

Postneonatal Mortality: See Mortality Categories.

Glossary (cont.)

Post Neonatal Mortality Rate (PNMR): See Mortality Rate Categories.

Prenatal Care Payment Source: Prenatal care payment source is self-reported by the mother. Four groupings are used in this report:

Private:	Blue Cross/Blue Shield and commercial insurance.
Public:	Mass Health (Medicaid), Healthy Start, Medicare, free care, and other government sources.
HMO:	Health maintenance organizations (HMOs) and other managed care entities. The HMO category may include Mass Health (Medicaid) recipients in managed care programs.
Other:	Any other payment source not included in the previous categories.

Race/Hispanic Ethnicity: Mother's race and Hispanic ethnicity are self-reported. All respondents indicating Hispanic ethnicity will be designated Hispanic regardless of their response to questions concerning racial identity.

Resident Birth: The birth of an infant whose mother reports her usual place of residence as Massachusetts. In Massachusetts, a resident is a person with a permanent address in one of the 351 cities or towns. Massachusetts resident births include all births that occur among residents of the Commonwealth whether they occur in Massachusetts or elsewhere.

Teen Birth Rate: The number of children born among females ages 15 to 19 divided by the population of females in that age group, multiplied by 1,000.

$$\text{Teen birth rate} = \frac{\text{Number of births to females ages 15-19 years old}}{\text{Number of females ages 15-19 years old in the population}} \times 1000$$

Very Low Birthweight (VLBW): See Birthweight Categories.

1997 Population Estimates of Females Ages 15 to 19 Years Living in the 25 Massachusetts Communities with the Highest Number of Teen Births in 1998

<u>Community</u>	<u>Estimated Number of Females, Ages 15-19 years</u>
<i>Massachusetts</i>	<i>203,601</i>
Attleboro	1,149
Boston	18,363
Brockton	2,708
Chelsea	866
Chicopee	1,774
Fall River	2,747
Fitchburg	1,643
Framingham	1,921
Haverhill	1,575
Holyoke	1,439
Lawrence	2,629
Leominster	1,126
Lowell	3,630
Lynn	2,507
Methuen	1,291
New Bedford	3,035
Pittsfield	1,427
Quincy	1,990
Revere	1,154
Salem	1,166
Somerville	1,634
Southbridge	549
Springfield	5,444
Taunton	1,538
Worcester	6,411

Source: 1997 estimates from MISER, November 1999. 1998 estimates are due June 30, 2000. (See Foreword for further information.)

1990-1998 Population Data and Birth Rate Comparison (Using Old and Updated Population Estimates) and Teen Birth Rates of Females Ages 15 to 19 Years Living in the 25 Massachusetts Communities with the Highest Number of Teen Births in 1998

Town Name	Year	Updated 15-19	Teen Births	New Rate	Old Rate	Difference
Attleboro	1990	1,154	53	45.9	45.9	0.0
	1991	1,078	42	39.0	37.4	4.3
	1992	1,055	41	38.9	37.5	3.7
	1993	1,038	56	53.9	52.6	2.5
	1994	1,017	49	48.2	47.4	1.7
	1995	1,051	47	44.7	46.8	-4.5
	1996	1,112	39	35.1	40.0	-12.4
	1997	1,149	36	31.3	38.1	-17.9
	1998	1,149	45	39.2	47.7	-17.8
Boston	1990	21,563	1,137	52.7	52.7	0.0
	1991	20,156	1,082	53.7	51.6	4.0
	1992	19,012	1,050	55.2	51.5	7.2
	1993	18,353	1,005	54.8	50.8	7.8
	1994	18,416	981	53.3	51.1	4.2
	1995	18,520	880	47.5	47.3	0.5
	1996	18,469	794	43.0	44.1	-2.5
	1997	18,363	825	44.9	47.4	-5.1
	1998	18,363	823	44.8	47.3	-5.1
Brockton	1990	3,185	216	67.8	67.8	0.0
	1991	2,934	208	70.9	66.7	6.4
	1992	2,795	221	79.1	72.3	9.3
	1993	2,694	207	76.8	69.2	11.0
	1994	2,702	204	75.5	69.7	8.3
	1995	2,719	183	67.3	63.9	5.3
	1996	2,731	208	76.2	74.4	2.4
	1997	2,708	196	72.4	71.7	0.9
	1998	2,708	178	65.7	65.1	0.9
Chelsea	1990	915	105	114.8	114.8	0.0
	1991	877	78	88.9	84.4	5.4
	1992	841	87	103.4	93.2	11.0
	1993	845	81	95.9	85.9	11.6
	1994	836	97	116.0	101.9	13.9
	1995	884	74	83.7	77.0	8.7
	1996	889	91	102.4	93.8	9.1
	1997	866	92	106.2	93.9	13.1
	1998	866	103	118.9	105.2	13.1
Chicopee	1990	1,870	84	44.9	44.9	0.0
	1991	1,727	69	40.0	37.4	6.7
	1992	1,718	76	44.2	41.8	5.8
	1993	1,703	63	37.0	35.2	5.1
	1994	1,697	69	40.7	39.1	3.9
	1995	1,738	59	33.9	34.0	-0.1
	1996	1,792	64	35.7	37.4	-4.6
	1997	1,774	63	35.5	37.4	-5.1
	1998	1,774	70	39.5	41.6	-5.1

1990-1998 Population Data and Birth Rate Comparison (Using Old and Updated Population Estimates) and Teen Birth Rates of Females Ages 15 to 19 Years Living in the 25 Massachusetts Communities with the Highest Number of Teen Births in 1998 (cont.)

Town Name	Year	Updated 15-19	Teen Births	New Rate	Old Rate	Difference
Fall River	1990	3,197	246	76.9	77.0	0.0
	1991	2,884	203	70.4	65.1	8.1
	1992	2,772	209	75.4	68.8	9.6
	1993	2,719	179	65.8	60.5	8.8
	1994	2,757	166	60.2	57.7	4.4
	1995	2,762	169	61.2	60.4	1.3
	1996	2,746	152	55.4	55.9	-1.0
	1997	2,747	141	51.3	53.5	-4.0
	1998	2,747	155	56.4	58.8	-4.0
Fitchburg	1990	1,778	146	82.1	82.1	0.0
	1991	1,645	98	59.6	55.9	6.5
	1992	1,573	107	68.0	62.0	9.7
	1993	1,559	100	64.1	58.8	9.1
	1994	1,586	106	66.8	63.3	5.6
	1995	1,610	93	57.8	56.4	2.4
	1996	1,613	100	62.0	61.7	0.6
	1997	1,643	88	53.6	55.1	-2.9
	1998	1,643	90	54.8	56.4	-2.9
Framingham	1990	2,240	44	19.6	19.6	0.0
	1991	2,069	50	24.2	23.2	4.0
	1992	1,973	47	23.8	22.8	4.6
	1993	1,932	40	20.7	20.2	2.3
	1994	1,885	53	28.1	28.1	0.2
	1995	1,901	51	26.8	28.3	-5.3
	1996	1,936	45	23.2	26.3	-11.6
	1997	1,921	61	31.8	37.6	-15.5
	1998	1,921	44	22.9	27.1	-15.4
Haverhill	1990	1,557	94	60.4	60.4	0.0
	1991	1,488	109	73.3	70.9	3.4
	1992	1,470	98	66.7	64.5	3.3
	1993	1,465	83	56.7	55.3	2.4
	1994	1,497	76	50.8	51.3	-1.1
	1995	1,550	88	56.8	60.2	-5.7
	1996	1,584	69	43.6	47.8	-8.9
	1997	1,575	87	55.2	61.1	-9.6
	1998	1,575	80	50.8	56.2	-9.6
Holyoke	1990	1,447	203	140.3	140.3	0.0
	1991	1,375	185	134.5	122.4	9.9
	1992	1,367	185	135.3	117.4	15.2
	1993	1,343	199	148.2	121.4	22.1
	1994	1,365	196	143.6	115.0	24.8
	1995	1,346	170	126.3	96.2	31.4
	1996	1,455	188	129.2	102.6	25.9
	1997	1,439	180	125.1	94.9	31.8
	1998	1,439	189	131.3	99.7	31.8

1990-1998 Population Data and Birth Rate Comparison (Using Old and Updated Population Estimates) and Teen Birth Rates of Females Ages 15 to 19 Years Living in the 25 Massachusetts Communities with the Highest Number of Teen Births in 1998 (cont.)

Town Name	Year	Updated 15-19	Teen Births	New Rate	Old Rate	Difference
Lawrence	1990	2,752	338	122.8	122.8	0.0
	1991	2,585	349	135.0	122.6	10.1
	1992	2,476	302	122.0	102.7	18.8
	1993	2,508	304	121.2	100.1	21.0
	1994	2,519	338	134.2	108.0	24.3
	1995	2,479	286	115.4	88.7	30.1
	1996	2,563	278	108.5	83.8	29.5
	1997	2,629	277	105.4	81.1	29.9
	1998	2,629	298	113.4	87.3	29.9
Leominster	1990	1,112	42	37.8	37.8	0.0
	1991	1,084	47	43.4	42.7	1.6
	1992	1,098	51	46.4	46.7	-0.6
	1993	1,102	64	58.1	59.2	-1.9
	1994	1,102	52	47.2	48.5	-2.8
	1995	1,121	60	53.5	56.6	-5.4
	1996	1,113	72	64.7	68.5	-5.6
	1997	1,126	43	38.2	41.3	-7.6
	1998	1,126	NA	NA	NA	NA
Lowell	1990	3,803	309	81.3	81.3	0.0
	1991	3,610	276	76.5	73.1	4.6
	1992	3,504	275	78.5	73.3	7.1
	1993	3,445	264	76.6	70.9	8.1
	1994	3,526	237	67.2	64.1	4.9
	1995	3,519	298	84.7	81.1	4.4
	1996	3,618	233	64.4	63.9	0.8
	1997	3,630	276	76.0	76.2	-0.2
	1998	3,630	239	65.8	66.0	-0.2
Lynn	1990	2,442	194	79.4	79.4	0.0
	1991	2,317	178	76.8	72.8	5.6
	1992	2,301	171	74.3	69.8	6.4
	1993	2,302	191	83.0	77.9	6.6
	1994	2,293	197	85.9	80.2	7.1
	1995	2,313	175	75.7	71.1	6.4
	1996	2,414	155	64.2	62.9	2.0
	1997	2,507	182	72.6	73.8	-1.6
	1998	2,507	191	76.2	77.4	-1.6
Methuen	1990	1,272	53	41.7	41.7	0.0
	1991	1,224	53	43.3	44.2	-2.1
	1992	1,207	37	30.7	32.9	-6.9
	1993	1,223	50	40.9	47.6	-14.1
	1994	1,213	52	42.9	53.3	-19.5
	1995	1,247	49	39.3	54.3	-27.7
	1996	1,271	42	33.0	50.7	-34.8
	1997	1,291	47	36.4	62.3	-41.6
	1998	1,291	48	37.2	63.7	-41.6

1990-1998 Population Data and Birth Rate Comparison (Using Old and Updated Population Estimates) and Teen Birth Rates of Females Ages 15 to 19 Years Living in the 25 Massachusetts Communities with the Highest Number of Teen Births in 1998 (cont.)

Town Name	Year	Updated 15-19	Teen Births	New Rate	Old Rate	Difference
New Bedford	1990	3,447	263	76.3	76.3	0.0
	1991	3,244	275	84.8	80.2	5.7
	1992	3,118	261	83.7	76.5	9.5
	1993	3,056	260	85.1	76.6	11.1
	1994	3,031	265	87.4	78.4	11.5
	1995	3,033	203	66.9	60.4	10.8
	1996	3,022	216	71.5	64.6	10.7
	1997	3,035	221	72.8	66.4	9.6
	1998	3,035	220	72.5	66.1	9.6
Pittsfield	1990	1,532	74	48.3	48.3	0.0
	1991	1,416	69	48.7	48.1	1.3
	1992	1,351	55	40.7	41.1	-1.0
	1993	1,325	49	37.0	39.5	-6.3
	1994	1,333	48	36.0	42.0	-14.2
	1995	1,393	68	48.8	65.0	-24.8
	1996	1,437	56	39.0	59.0	-33.9
	1997	1,427	58	40.6	68.0	-40.2
	1998	1,427	68	47.7	79.7	-40.2
Quincy	1990	2,322	51	22.0	22.0	0.0
	1991	2,106	57	27.1	26.2	3.4
	1992	2,047	55	26.9	27.0	-0.6
	1993	1,992	47	23.6	24.9	-5.1
	1994	1,977	42	21.2	24.1	-11.7
	1995	1,988	44	22.1	27.5	-19.4
	1996	2,009	38	18.9	26.1	-27.4
	1997	1,990	38	19.1	28.9	-34.0
	1998	1,990	46	23.1	35.0	-34.0
Revere	1990	1,065	45	42.3	42.3	0.0
	1991	1,004	36	35.9	36.6	-2.1
	1992	961	58	60.4	64.3	-6.2
	1993	933	32	34.3	39.0	-12.1
	1994	966	49	50.7	66.3	-23.5
	1995	1,048	44	42.0	67.0	-37.3
	1996	1,079	38	35.2	66.0	-46.7
	1997	1,154	46	39.9	93.2	-57.2
	1998	1,154	46	39.9	93.1	-57.2
Salem	1990	1,270	45	35.4	35.4	0.0
	1991	1,211	42	34.7	34.0	2.1
	1992	1,184	55	46.5	45.8	1.5
	1993	1,182	44	37.2	37.7	-1.2
	1994	1,191	35	29.4	30.9	-4.8
	1995	1,207	45	37.3	40.9	-8.9
	1996	1,208	40	33.1	37.5	-11.7
	1997	1,166	35	30.0	33.9	-11.5
	1998	1,166	NA	NA	NA	NA

1990-1998 Population Data and Birth Rate Comparison (Using Old and Updated Population Estimates) and Teen Birth Rates of Females Ages 15 to 19 Years Living in the 25 Massachusetts Communities with the Highest Number of Teen Births in 1998 (cont.)

Town Name	Year	Updated 15-19	Teen Births	New Rate	Old Rate	Difference
Somerville	1990	2,192	64	29.2	29.2	0.0
	1991	2,039	64	31.4	30.1	4.4
	1992	1,860	65	34.9	31.5	11.1
	1993	1,804	65	36.0	32.4	11.1
	1994	1,701	73	42.9	37.6	14.1
	1995	1,644	57	34.7	30.3	14.3
	1996	1,633	71	43.5	39.1	11.2
	1997	1,634	58	35.5	33.1	7.3
	1998	1,634	60	36.7	34.2	7.3
Southbridge	1990	582	48	82.5	82.5	0.0
	1991	544	46	84.6	80.2	5.4
	1992	545	51	93.6	90.2	3.7
	1993	557	51	91.6	91.6	0.0
	1994	554	50	90.3	91.2	-1.0
	1995	550	43	78.2	79.6	-1.8
	1996	552	38	68.8	71.5	-3.7
	1997	549	48	87.4	91.7	-4.7
	1998	549	46	83.8	88.0	-4.8
Springfield	1990	5,949	523	87.9	87.9	0.0
	1991	5,630	561	99.6	94.7	5.2
	1992	5,408	523	96.7	88.6	9.1
	1993	5,394	567	105.1	96.5	9.0
	1994	5,364	563	105.0	96.2	9.2
	1995	5,395	448	83.0	76.8	8.1
	1996	5,422	479	88.3	82.5	7.1
	1997	5,444	476	87.4	82.3	6.2
	1998	5,444	458	84.1	79.2	6.3
Taunton	1990	1,557	95	61.0	61.0	0.0
	1991	1,503	96	63.9	62.7	1.8
	1992	1,478	79	53.5	52.5	1.8
	1993	1,455	88	60.5	59.6	1.6
	1994	1,471	87	59.1	59.9	-1.3
	1995	1,519	85	56.0	59.7	-6.2
	1996	1,552	98	63.1	70.1	-9.9
	1997	1,538	70	45.5	51.0	-10.8
	1998	1,538	70	45.5	51.0	-10.8
Worcester	1990	6,784	399	58.8	58.8	0.0
	1991	6,374	388	60.9	58.2	4.6
	1992	6,174	384	62.2	58.6	6.1
	1993	6,087	395	64.9	61.4	5.8
	1994	6,135	345	56.2	54.6	3.1
	1995	6,211	349	56.2	56.2	-0.1
	1996	6,375	304	47.7	49.9	-4.5
	1997	6,411	313	48.8	52.4	-6.8
	1998	6,411	328	51.2	54.9	-6.8

Note: New rates are calculated using the 1991-1997 MISER estimates released in September 1999 (1991-1995) and November 1999 (1996-1997). Number of Births: Registry of Vital Records and Statistics, MDPH, BHRSE: 1990-1998. Old population estimates are available upon request.

Massachusetts Cities, Towns, Counties, and Community Health Network Areas (CHNAs)

City/Town	County	CHNA	City/Town	County	CHNA
Abington	Plymouth	22	Dartmouth	Bristol	26
Acton	Middlesex	15	Dedham	Norfolk	18
Acushnet	Bristol	26	Deerfield	Franklin	2
Adams	Berkshire	1	Dennis	Barnstable	27
Agawam	Hampden	4	Dighton	Bristol	24
Alford	Berkshire	1	Douglas	Worcester	6
Amesbury	Essex	12	Dover	Norfolk	18
Amherst	Hampshire	3	Dracut	Middlesex	10
Andover	Essex	11	Dudley	Worcester	5
Arlington	Middlesex	17	Dunstable	Middlesex	10
Ashburnham	Worcester	9	Duxbury	Plymouth	23
Ashby	Middlesex	9	East Bridgewater	Plymouth	22
Ashfield	Franklin	2	East Brookfield	Worcester	5
Ashland	Middlesex	7	East Longmeadow	Hampden	4
Athol	Worcester	2	Eastham	Barnstable	27
Attleboro	Bristol	24	Easthampton	Hampshire	3
Auburn	Worcester	8	Easton	Bristol	22
Avon	Norfolk	22	Edgartown	Dukes	27
Ayer	Middlesex	9	Egremont	Berkshire	1
Barnstable	Barnstable	27	Erving	Franklin	2
Barre	Worcester	9	Essex	Essex	13
Becket	Berkshire	1	Everett	Middlesex	16
Bedford	Middlesex	15	Fairhaven	Bristol	26
Belchertown	Hampshire	3	Fall River	Bristol	25
Bellingham	Norfolk	6	Falmouth	Barnstable	27
Belmont	Middlesex	17	Fitchburg	Worcester	9
Berkley	Bristol	24	Florida	Berkshire	1
Berlin	Worcester	9	Foxborough	Norfolk	7
Bernardston	Franklin	2	Framingham	Middlesex	7
Beverly	Essex	13	Franklin	Norfolk	6
Billerica	Middlesex	10	Freetown	Bristol	26
Blackstone	Worcester	6	Gardner	Worcester	9
Blandford	Hampden	4	Gay Head	Dukes	27
Bolton	Worcester	9	Georgetown	Essex	12
Boston	Suffolk	19	Gill	Franklin	2
Bourne	Barnstable	27	Gloucester	Essex	13
Boxborough	Middlesex	15	Goshen	Hampshire	3
Boxford	Essex	12	Gosnold	Dukes	27
Boylston	Worcester	8	Grafton	Worcester	8
Braintree	Norfolk	20	Granby	Hampshire	3
Brewster	Barnstable	27	Granville	Hampden	4
Bridgewater	Plymouth	22	Great Barrington	Berkshire	1
Brimfield	Hampden	5	Greenfield	Franklin	2
Brockton	Plymouth	22	Groton	Middlesex	9
Brookfield	Worcester	5	Groveland	Essex	12
Brookline	Norfolk	19	Hadley	Hampshire	3
Buckland	Franklin	2	Halifax	Plymouth	23
Burlington	Middlesex	15	Hamilton	Essex	13
Cambridge	Middlesex	17	Hampden	Hampden	4
Canton	Norfolk	20	Hancock	Berkshire	1
Carlisle	Middlesex	15	Hanover	Plymouth	23
Carver	Plymouth	23	Hanson	Plymouth	23
Charlemont	Franklin	2	Hardwick	Worcester	9
Charlton	Worcester	5	Harvard	Worcester	9
Chatham	Barnstable	27	Harwich	Barnstable	27
Chelmsford	Middlesex	10	Hatfield	Hampshire	3
Chelsea	Suffolk	19	Haverhill	Essex	12
Cheshire	Berkshire	1	Hawley	Franklin	2
Chester	Hampden	3.1	Heath	Franklin	2
Chesterfield	Hampshire	3	Hingham	Plymouth	20
Chicopee	Hampden	3.1	Hinsdale	Berkshire	1
Chilmark	Dukes	27	Holbrook	Norfolk	22
Clarksburg	Berkshire	1	Holden	Worcester	8
Clinton	Worcester	9	Holland	Hampden	5
Cohasset	Norfolk	20	Holliston	Middlesex	7
Colrain	Franklin	2	Holyoke	Hampden	3.1
Concord	Middlesex	15	Hopedale	Worcester	6
Conway	Franklin	2	Hopkinton	Middlesex	7
Cummington	Hampshire	3	Hubbardston	Worcester	9
Dalton	Berkshire	1	Hudson	Middlesex	7
Danvers	Essex	14	Hull	Plymouth	20

City/Town	County	CHNA	City/Town	County	CHNA
Huntington	Hampshire	3.1	Northampton	Hampshire	3
Ipswich	Essex	13	Northborough	Worcester	7
Kingston	Plymouth	23	Northbridge	Worcester	6
Lakeville	Plymouth	24	Northfield	Franklin	2
Lancaster	Worcester	9	Norton	Bristol	24
Lanesborough	Berkshire	1	Norwell	Plymouth	20
Lawrence	Essex	11	Norwood	Norfolk	20
Lee	Berkshire	1	Oak Bluffs	Dukes	27
Leicester	Worcester	8	Oakham	Worcester	9
Lenox	Berkshire	1	Orange	Franklin	2
Leominster	Worcester	9	Orleans	Barnstable	27
Leverett	Franklin	2	Otis	Berkshire	1
Lexington	Middlesex	15	Oxford	Worcester	5
Leyden	Franklin	2	Palmer	Hampden	4
Lincoln	Middlesex	15	Paxton	Worcester	8
Littleton	Middlesex	15	Peabody	Essex	14
Longmeadow	Hampden	4	Pelham	Hampshire	3
Lowell	Middlesex	10	Pembroke	Plymouth	23
Ludlow	Hampden	3.1	Pepperell	Middlesex	9
Lunenburg	Worcester	9	Peru	Berkshire	1
Lynn	Essex	14	Petersham	Worcester	2
Lynnfield	Essex	14	Phillipston	Worcester	2
Malden	Middlesex	16	Pittsfield	Berkshire	1
Manchester	Essex	13	Plainfield	Hampshire	3
Mansfield	Bristol	24	Plainville	Norfolk	7
Marblehead	Essex	14	Plymouth	Plymouth	23
Marion	Plymouth	26	Plympton	Plymouth	23
Marlborough	Middlesex	7	Princeton	Worcester	9
Marshfield	Plymouth	23	Provincetown	Barnstable	27
Mashpee	Barnstable	27	Quincy	Norfolk	20
Mattapoisett	Plymouth	26	Randolph	Norfolk	20
Maynard	Middlesex	7	Raynham	Bristol	24
Medfield	Norfolk	7	Reading	Middlesex	14
Medford	Middlesex	16	Rehoboth	Bristol	24
Medway	Norfolk	6	Revere	Suffolk	19
Melrose	Middlesex	14	Richmond	Berkshire	1
Mendon	Worcester	6	Rochester	Plymouth	26
Merrimac	Essex	12	Rockland	Plymouth	23
Methuen	Essex	11	Rockport	Essex	13
Middleborough	Plymouth	24	Rowe	Franklin	2
Middlefield	Hampshire	3	Rowley	Essex	12
Middleton	Essex	11	Royalston	Worcester	2
Milford	Worcester	6	Russell	Hampden	4
Millbury	Worcester	8	Rutland	Worcester	9
Millis	Norfolk	7	Salem	Essex	14
Millville	Worcester	6	Salisbury	Essex	12
Milton	Norfolk	20	Sandisfield	Berkshire	1
Monroe	Franklin	2	Sandwich	Barnstable	27
Monson	Hampden	4	Saugus	Essex	14
Montague	Franklin	2	Savoy	Berkshire	1
Monterey	Berkshire	1	Scituate	Plymouth	20
Montgomery	Hampden	4	Seekonk	Bristol	24
Mt. Washington	Berkshire	1	Sharon	Norfolk	20
Nahant	Essex	14	Sheffield	Berkshire	1
Nantucket	Nantucket	27	Shelburne	Franklin	2
Natick	Middlesex	7	Sherborn	Middlesex	7
Needham	Norfolk	18	Shirley	Middlesex	9
New Ashford	Berkshire	1	Shrewsbury	Worcester	8
New Bedford	Bristol	26	Shutesbury	Franklin	2
New Braintree	Worcester	9	Somerset	Bristol	25
New Marlborough	Berkshire	1	Somerville	Middlesex	17
New Salem	Franklin	2	South Hadley	Hampshire	3
Newbury	Essex	12	Southampton	Hampshire	3
Newburyport	Essex	12	Southborough	Worcester	7
Newton	Middlesex	18	Southbridge	Worcester	5
Norfolk	Norfolk	7	Southwick	Hampden	4
North Adams	Berkshire	1	Spencer	Worcester	5
North Andover	Essex	11	Springfield	Hampden	4
N. Attleborough	Bristol	24	Sterling	Worcester	9
North Brookfield	Worcester	5	Stockbridge	Berkshire	1
North Reading	Middlesex	14	Stoneham	Middlesex	14

City/Town	County	CHNA	
Stoughton	Norfolk	22	
Stow	Middlesex	7	
Sturbridge	Worcester	5	
Sudbury	Middlesex	7	
Sunderland	Franklin	2	
Sutton	Worcester	6	
Swampscott	Essex	14	
Swansea	Bristol	25	
Taunton	Bristol	24	Community Health Network Areas
Templeton	Worcester	9	
Tewksbury	Middlesex	10	1. Community Health Network of Berkshire
Tisbury	Dukes	27	2. Upper Valley health Web (Franklin County)
Tolland	Hampden	4	3. Partnership for Health in Hampshire County (Greater Northampton Area)
Topsfield	Essex	13	3.1 Four (For) Communities (Greater Holyoke)
Townsend	Middlesex	9	4. The Community Health Connection (Greater Springfield)
Truro	Barnstable	27	5. Greater Southbridge Community Health Network
Tyngsborough	Middlesex	10	6. Community Partners for Health (Greater Milford Area)
Tyringham	Berkshire	1	7. CHN of Greater Metro West (Greater Framingham Area)
Upton	Worcester	6	8. Community Wellness Coalition (Greater Worcester)
Uxbridge	Worcester	6	9. Fitchburg/Gardner Community Health Network
Wakefield	Middlesex	14	10. Greater Lowell Community Health Network
Wales	Hampden	5	11. Greater Lawrence Community Health Network
Walpole	Norfolk	7	12. Greater Haverhill Community Health Network
Waltham	Middlesex	18	13. Greater Beverly/Gloucester CHN
Ware	Hampshire	3	14. North Shore Community Health Network
Wareham	Plymouth	26	15. Greater Woburn/Concord/Littleton CHN
Warren	Worcester	5	16. North Suburban Health Alliance (Malden/Medford/Melrose Area)
Warwick	Franklin	2	17. Greater Cambridge/Somerville CHN
Washington	Berkshire	1	18. West Suburban Health Network (Newton/Waltham)
Watertown	Middlesex	17	19. Alliance for Community Health (City of Boston/Chelsea/Revere/Winthrop Area)
Wayland	Middlesex	7	20. Blue Hills Community Health Alliance (Greater Quincy Area)
Webster	Worcester	5	22. Greater Brockton Community Health Network
Wellesley	Norfolk	18	23. South Shore Community Partners in Prevention (Greater Plymouth Area)
Wellfleet	Barnstable	27	24. Health & Education Response (Greater Attleboro/Taunton Area)
Wendell	Franklin	2	25. Partners for a Healthier Community (Greater Fall River)
Wenham	Essex	13	26. Greater New Bedford Community Health Network
West Boylston	Worcester	8	27. Cape and Islands Community Health Network
West Bridgewater	Plymouth	22	
West Brookfield	Worcester	5	
West Newbury	Essex	12	
West Springfield	Hampden	4	
West Stockbridge	Berkshire	1	
West Tisbury	Dukes	27	
Westborough	Worcester	7	
Westfield	Hampden	3.1	
Westford	Middlesex	10	
Westhampton	Hampshire	3	
Westminster	Worcester	9	
Weston	Middlesex	18	
Westport	Bristol	25	
Westwood	Norfolk	18	
Weymouth	Norfolk	20	
Whately	Franklin	2	
Whitman	Plymouth	22	
Wilbraham	Hampden	4	
Williamsburg	Hampshire	3	
Williamstown	Berkshire	1	
Wilmington	Middlesex	15	
Winchendon	Worcester	9	
Winchester	Middlesex	15	
Windsor	Berkshire	1	
Winthrop	Suffolk	19	
Woburn	Middlesex	15	
Worcester	Worcester	8	
Worthington	Hampshire	3	
Wrentham	Norfolk	7	
Yarmouth	Barnstable	27	